

Water, Field Scale and Watershed Scale Computer Models, Field and/or Point Assessment Tools, and Tools Under Development

1. **Agricultural Non-Point Source Pollution Model (AGNPS)** is an USDA - Agricultural Research Service developed computer program designed to evaluate non point source pollution from agricultural watersheds. Outputs related to soluble nitrogen and phosphorus for surface water and infiltration are provided. Sediment yield and runoff are calculated, and sediment transported nitrogen and phosphorus are determined. Nutrient concentrations from feedlots and other point sources and chemical oxygen demand are modeled. Individual feedlot potential ratings can also be derived using the model.

- [View Factsheet about AGNPS](#)
- [Model Information and Retrieval](#)
- [Comments, Assistance, or model experience](#)

2. **Agricultural Waste Management Field Handbook** provides excellent technical information, worksheets, and planning guidance for dealing with waste management problems. Animal wastes and dead animals may contain pathogens, nutrients and organics, salts, and heavy metals. An assessment of the handling, storage, and use of animal wastes and dead animals can provide information to deal with surface and ground water concerns. The handbook provides details for developing Agricultural Waste Management Plans and Waste Utilization Plans to provide for water quality protection.

- [Comments, Assistance, or model experience](#)

3. **Aquatic Habitat Evaluation Procedures (AHEP)** is a procedure to evaluate the condition for fishery habitat for various stream segments. AHEP requires measured and observed input from field conditions, water quality data, and fishery models.

- [Comments or model experience](#)

4. **Annualized Agricultural Non-Point Source Pollution Model (Ann AGNPS)** is a annualized multi event modification of AGNPS. point source pollution from agricultural watersheds. Outputs related to soluble nitrogen and phosphorus for surface water and infiltration are provided. Sediment yield and runoff are calculated, and sediment transported nitrogen and phosphorus are determined. Nutrient concentrations from feedlots and other point sources and chemical oxygen demand are modeled. Individual feedlot potential ratings can also be derived using the model.

- [Comments, Assistance, or model experience](#)

5. **ANSWERS** is an US - Environmental Protection Agency single event grid model that can be used for watersheds of up to 10,000 acres. ANSWERS provides sediment yield, nutrient loads in water and sediment, and runoff values.

- [Comments or model experience](#)

6. **Animal Waste Management (AWM)** is a computer program designed to automate animal waste management system designs. It performs calculations that are necessary to design a waste treatment or storage facility and guidance on considerations for operating and managing the system.

- [View Factsheet about AWM Software](#)
- [Model Information and Retrieval](#)
- [Comments, Assistance, or model experience](#)

7. **BASINS** is an US - Environmental Protection Agency GIS system that links information on sources of pollutants with water quality.

- [View Factsheet about BASINS](#)
- [Comments, Assistance, or model experience](#)

8. **Box Exchange Transport Temperature Ecology Reservoir (BETTER)** is a two dimensional water quality model for predicting vertical & longitudinal gradients of temperature, pH, dissolved oxygen, nutrients, and algae biomass. The model was developed to aid in reservoir sampling design and analysis of observed water quality patterns.

- [Comments or model experience](#)

9. **Carlson's Trophic State Index Model (TSI)** was developed at Kent State University by Dr. Robert Carlson. The model predicts the trophic state of a lake based on total phosphorus, secchi disk readings, and chlorophyll A.

- [Comments or model experience](#)

10. **CHEMRANK** is interactive software procedure designed to provide multiple schemes for ranking the potential for organic chemicals to leach into ground water for different soils and conditions. Four ranking schemes are supported by software, each having different data requirements, ranking criteria, and assumptions.

- [Model Information and Retrieval](#)
- [Comments or model experience](#)

11. **Chemical Movement in Layered Soils (CMLS94)** is a program that illustrates the influence of soil properties, chemical properties, rooting depth, precipitation, and evapotranspiration upon the movement and persistence of surface applied organic chemicals (pesticides) on well drained soils. Graphical outputs illustrate the impact of soil and chemical properties and climate on chemical movement.

- [Model Information and Retrieval](#)
- [Comments or model experience](#)

12. **Coordinated Farm and Research Management Model (COFARM)** is a computer program that combines information on soils, crop yields, and management history into a soil-crop simulation system. The present application of the model is limited to the upper middle west, but expansion of its use to a national base is planned.

- Comments or model experience

13. **CONUSE 5** is a Natural Resources Conservation Service (CA) field scale computer model that calculates effective rainfall, monthly crop evapotranspiration, and net irrigation requirements using the Modified Blaney-Criddle method, based on average monthly temperature and latitude. The program allows for corrections in relative humidity, cloudiness, and wind speed. It determines periods of rainfall in excess of crop evapotranspiration and can be used for planning nutrient and pesticide applications.

- Comments or model experience

14. **CONUSE 6** is a water budget model based on the revision of CONUSE 5. Modifications are being made to calculate the time and amount of water in excess of crop needs and to estimate the portion going to runoff and deep percolation. A graphics package is to be added to display the results.

- Comments or model experience

15. **Chemical, Runoff, and Erosion from Agricultural Management Systems (CREAMS)** is an USDA - Agricultural Research Service developed field scale model. CREAMS is divided into three components: hydrology, erosion/sediment yield, and chemicals. It estimates the effect runoff, sediment, pesticides, and nutrients have on non point source water pollution and can be used to rank different management systems.

- Comments, Assistance, or model experience

16. **DRAINMOD** is a computer program that simulates the performance of water table management systems. It is specifically adapted for soils that have a high water table. Hydrologic components, such as subsurface drainage, sub-irrigation, evapotranspiration, and surface runoff, are quantified. The model predicts water table depth, drainage rates, surface runoff, evapotranspiration, irrigation volume, and crop yield. Alternative management systems may be evaluated with regard to excess water available to transport nutrients, pesticides, salinity, and heavy metals.

- Model Information and Retrieval
- Comments, Assistance, or model experience

17. **DRASTIC** is a standardized system for evaluating ground water pollution potential using hydrologic settings. The system was developed by the Environmental Protection Agency (EPA) and allows for the designation of mapable units (hydrologic settings) and a relative rating system for pollution potential. DRASTIC provides a method for developing maps used to evaluate ground water vulnerability interpretations and maps. DRASTIC maps are available for many states or areas of states.

- Comments, or model experience

18. **Ephemeral Gully Erosion Model (EGEM)** predicts ephemeral gully erosion on cropland for an average annual rainfall or a single storm event. EGEM works on gullies formed in drainage areas of 0.25 to 100 acres. Outputs can be combined with a sediment delivery ratio to provide a volume of sediment delivered to a water body.

- Comments or model experience

19. **Erosion/Productivity Impact Calculator (EPIC)** is an USDA - Agricultural Research Service developed field sized model used to determine the effect of management strategies on water quality. EPIC provides the following outputs: (1) Water movement - volume of surface runoff, days of runoff, and

percolation below the root zone. (2) N loss in percolate and subsurface flow used to assess hazards to ground water. (3) Nutrient loss in surface runoff and erosion - soluble and attached N, and soluble P and P loss with sediment. (4) Erosion assessment - sediment loss and associated chemicals. (5) Pesticide loss in runoff and below the root zone - for selected pesticides.

- [View Factsheet about EPIC](#)
- [Download the EPIC model](#)
- [Comments, Assistance, or model experience](#)

20. **Farmstead Assessment System (Farm*A*Syst)** provides information on how farmstead activities may affect drinking water. Farm*A*Syst consists of 12 worksheets to assess individual farm practices, and accompanying publications containing recommendations on modifying practices to minimize farmstead pollution risks. Farm*A*Syst was jointly developed by Wisconsin and Minnesota Extension Service and the EPA. Procedures to adapt Farm*A*Syst to any state are currently under development. Note: a version of this may be in FOCS 1.2. Specific evaluation questions are determined on a state by state basis. Worksheet 11, site evaluation may need to be modified. Consult with state geologist.

- [Comments, Assistance, or model experience](#)

21. **Farm Bureau's Ground water & Environmental Pollutionself-help Checklist** can help analyze water supplies and farming operations. The checklist asks for background information, potential pollutants, offsite assessment, fertilizer, chemical storage, and container disposal. It also provides information on how to take a water sample.

- [Comments, or model experience](#)

22. **Farm Scale Screening** is a Field Office Computing System (FOCS) adaptation of the Farm*A*Syst Water Quality Tool. It is an integrated computer-assisted process that automates functions needed for the field offices to assist clients in learning how their current farmstead management practices and structures impact the quality of their groundwater and drinking water resources.

- [Comments, Assistance, or model experience](#)

23. **Ground water Loading Effects of Agricultural Management Systems (GLEAMS)** is an USDA - Agricultural Research Service field scale model that was developed as an extension of CREAMS. GLEAMS evaluates potential pesticide leaching below the root zone, pesticide movement with surface runoff, and sediment losses from a field. It is a tool for evaluating management systems and does not provide an absolute prediction of pollutant loading.

- [View Factsheet about GLEAMS](#)
- [Download the GLEAMS model](#)
- [Comments, Assistance, or model experience](#)

24. **Hach Kits** can assess basic surface water quality parameters such as pH, temperature, nitrate-nitrite concentration, and total phosphorus concentration. The kit provides quantified measurements for parameters tested.

- [Comments, or model experience](#)

25. **Hydrology Simulation Procedure - FORTRAN (HSPF)** is an US - Environmental Protection Agency

developed watershed simulation model. HSPF provides detailed hydrologic information on yield of water and sediment and has the potential for adding NPS pollutants to output.

- [View Factsheet about HSPF](#)
- [Model Information and Retrieval](#)
- [Comments or model experience](#)

26. **Hydrologic Unit Water Quality (HUWQ)** is a USDA - Natural Resources Conservation Service product that provides a GIS interface to AGNPS, SWRRBWQ, EPIC, and GLEAMS.

- [Model Information and Retrieval](#)
- [Comments, Assistance, or model experience](#)

27. **Leaching Index Maps** indicate an estimated quantity of water that is leached below the root zone for four hydrologic soil groups. Leaching maps or a listing of local soils and leaching ratings need to be in the FOTG.

- [Comments or model experience](#)

28. **LEACHM** is a research model that uses hydrology and a nitrogen balance to estimate nitrogen transport. LEACHM, a subroutine of LEACHM, provides pesticide transport.

- [Model information and Retrieval](#)
- [Background, Experiences, & Publications](#)
- [Comments or model experience](#)

29. **Modified Universal Soil Loss Equation (MUSLE)** is an ARS developed manual process that provides information on tons per acre of fine sediment delivered to a water body for a single storm event.

- [Comments or model experience](#)

30. **MWASTE** is a model used for evaluating coliform contamination in runoff from animal waste management systems. It is designed to follow organisms from the time they leave an animal until they reach surface runoff. The user inputs weather, soil, topographic, and management data. The model generates numbers of fecal coliform and fecal streptococcus that leave the operation in runoff.

- [Comments, Assistance, or model experience](#)

31. **National Agricultural Pesticide Risk Analysis (NAPRA)** is an automated pesticide risk screening process that uses the environmental fate model GLEAMS.

- [View Factsheet about NAPRA](#)
- [Comments, Assistance, or model experience](#)

32. **Nitrate Leaching and Economic Analysis Package (NLEAP)** is a computer model for field scale assessment of potential nitrate N leaching. Basic information concerning farm management practices, soils, and climate are translated into projected N budgets and nitrate N leaching indices.

- [View Factsheet about NLEAP](#)
- [Model Information and Retrieval](#)
- [Background, Experiences, and Publications](#)

- [Comments, Assistance, or Model Experience](#)

33. **Farm Nutrient Management Planning (NMP)** is a Pennsylvania State University computer program that uses on-farm data to provide manure and nutrient application recommendations to the landowner. NMP relates the quantity of manure being produced on a farm to the nutrient status of the soils and nutrient requirement of crop so the manure and any additional fertilizer is allocated to the field in proper amounts.

- [Comments or model experience](#)

34. **No-Till Users' Manual** contains a step by step procedure for implementing no-till. The process provides for evaluation of present conditions and identification of problems. It suggests management activities or actions to improve the likelihood of success of no-till.

- [Comments, or model experience](#)

35. **National Pesticide/soils database and User decision support system for Risk assessment of Ground and surface water contamination (NPURG)** is an automated version of the Soil/Pesticide Interaction Screening Procedure. The screening tool provides leaching potential and surface loss potential for a selected soil and pesticide. It can also be used to determine the Nitrate Leaching Index and the USDA - Environmental Protection Agency ground water contamination classification.

- [View Factsheet about NPURG](#)
- [Comments or model experience](#)

36. **NRCS/ARS/CES Pesticide Properties Database** The NRCS/ARS/CES PPD was designed for use in SPISP, NAPRA (National Agricultural Pesticide Risk Analysis), GLEAMS (Ground water Loading Effects of Agricultural Management Systems) and other pesticide environmental fate models.

- [Comments or Model Experience](#)

37. **Nitrogen, Tillage, Residue Management Model (NTRM)** is an USDA - Agricultural Research Service developed model. It is designed to evaluate the effects of alternative management practices on soil erosion, fertility, tillage, crop residue, nitrogen fertilization, and irrigation. The model can consider the effect of erosion on the productivity of 21 crops and the movement of nitrate nitrogen in and through the soil.

- [View Factsheet about NTRM](#)
- [Comments or model experience](#)

38. **Nutrient Budget Worksheets** provide for assessment of fertility programs. The worksheets provide a means to record and compare plant nutrient needs with nutrients available residually and applied as commercial fertilizer and organic waste. If plant nutrient needs are less than nutrient applications or improper timing is used, the potential for nutrient loss to surface or ground water increases.

- [Comments, or model experience](#)

39. **Nutrient Screening Tool** is an USDA - Natural Resources Conservation Service integrated computer-assisted process that automates functions needed for the field offices to identify and rate potential water quality problems on specific land units. The tool helps determine to what degree the inherent characteristics of the land (sensitivity) and the management practices on the land (potential vulnerability) contribute to groundwater and surface water problems.

- [Factsheet about Nutrient Screening](#)
- [Comments, Assistance, or model experience](#)

40. **Pesticide Control Worksheets** are tools to collect pesticide use information on fields and farming systems. The worksheets provide a means to assess operators use of pesticides, the alternatives (chemical or non-chemical) available, and the soil leaching and runoff potential for chemicals at a site.

- [Comments or Model Experience](#)

41. **Pesticide Screening Tool** is an USDA - Natural Resources Conservation Service integrated computer-assisted process that automates functions needed for the field offices to screen soil and pesticide combinations for potential pesticide loss, and display the results in a simple pass/evaluate further format.

- [Factsheet about Pesticide Screening](#)
- [Comments, Assistance, or model experience](#)

42. **Pesticide Root Zone Model (PRZM)** is an US - Environmental Protection Agency developed model that predicts the transport and transformation of pesticides in surface soils (root zone). PRZM handles hydrology, soil hydraulics, chemical transport, and chemical mass balance in soils to provide percent of pesticides remaining in soils over time.

- [View Factsheet about PRZM](#)
- [Model Information and Retrieval](#)
- [Comments or model experience](#)

43. **Rapid Bioassessment Protocols for Use In Streams and Rivers (RBP)** is a program designed to provide basic aquatic life data for planning and management purposes. RBP can be used for screening, site ranking, project evaluation, and trend monitoring. All of the protocols use fundamental assessment techniques to generate basic information on ambient physical, chemical, and biological conditions. RBP can be used to identify pollutants, locate sources, measure progress during implementation, assist in redirecting efforts, and evaluate project success.

- [Comments or model experience](#)

44. **ROTO** is a river basin model under development by USDA - Agricultural Research Service. ROTO can be used with SWRRBWQ and EPIC to identify areas in a river basin that are contributing to water quality problems.

- [Comments or model experience](#)

45. **Revised Universal Soil Loss Equation (RUSLE)** is an updated version of USLE that is available in both computer and non-computer forms. The use of RUSLE for water quality assessment is the same as described for USLE.

- [Comments or model experience](#)

46. **Root Zone Water Quality Model (RZWQM)** is an USDA - Agricultural Research Service research model that simulates soil water and plant chemical movement to predict runoff and leaching including pesticide, and nutrient transport.

- [View Factsheet about RZWQM](#)
- [Comments or model experience](#)

47. **SCS SCHEDULER** is a Natural Resources Conservation Service computerized program for site specific (field, soil, crop, and climate) irrigation scheduling. Daily climatic data are used to calculate crop evapotranspiration and maintain a daily record of soil water content in the root zone throughout the growing season. Crop evapotranspiration, soil air water content, timing, and amount of excess water is calculated and can be displayed. This information can be used to identify critical timing for nutrient and pesticide application. The model can also provide an indication of ground water condition based on before and after conditions related to irrigation water management.

- [Comments, Assistance, or model experience](#)

48. **Sediment Delivery Ratio Curves** provide estimates of sediment delivered to a point from a specified drainage area for various estimated erosion rates. These curves generally are not available in technical guides for field office use; however, some curves are in the USDA - Natural Resource Conservation Service National Engineering Handbook, Section 3, Sedimentation.

- [Comments or model experience](#)

49. **A System for Early Evaluation of the Pollution Potential of Agricultural Ground water Environments (SEEPAGE)** is a Natural Resources Conservation Service procedure for evaluating ground water pollution potential of sites. The procedure uses a quantitative ranking of factors and an average numerical rating affecting a site's vulnerability to ground water contamination from dispersed and concentrated sources. SEEPAGE can be used as a screening tool to identify relative risks of ground water contamination for various sites.

- [Comments, Assistance, or model experience](#)

50. **Soil Rating for Nitrate and Soluble Nutrients** provides information for determining the degree water percolates below the root zone in soils. The procedure can be used to evaluate the potential for contaminating ground water with soluble nutrients. Leaching indexes have been developed for each hydrologic soil group in all states. In areas where ground water concerns exist, this tool can aid in determining the potential for contamination of ground water from soluble nutrients. Nutrient management recommendations can be based upon the amount of leaching below the root zone.

- [Comments or model experience](#)

51. **Soil Surveys**, available at local Natural Resource Conservation Service field offices, provide information on the likelihood and degree of salinity and heavy metal problems associated with particular soils. They also provide ratings of leaching and runoff used in the SPISP and Nitrogen Leaching Evaluation. Information on percolation, drainage, erosion, and numerous other factors influencing water quality is also given.

- [Comments, Assistance, or model experience](#)

52. **Soil - Plant - Air - Water (SPAW)** is an USDA - Agricultural Research Service computer moisture balance model, with emphasis on the soil moisture capability for a variety of methods for irrigation scheduling and nitrogen budgeting. Required inputs are climate, soils, and crops. Outputs include daily soil water estimates, percolation, crop water requirements and nitrogen status.

- [Comments, Assistance, or model experience](#)

53. **Soil - Pesticide Interaction Screening Procedure (SPISP)** provides a method for determining the relative leaching and runoff potential for most pesticide and soil/site combinations. SPISP uses soils interpretations and the NRCS/ARS/CRS selected properties database. The screening procedure was designed so there is a high confidence where loss ratings are low, but low confidence where a loss is indicated. The procedure gives the relative loss from the root zone or edge of field but may not represent a contribution of a pesticide to ground or surface waters. The ratings can provide a basis for planning "pest management". This program is closely related to NPURG.

- [Comments, Assistance, or model experience](#)

54. **Simulation of Production and Utilization on Rangeland (SPUR)** is an ARS developed rangeland ecosystem model. The model has two versions: field level and watershed. Plant growth and hydrologic status are used to determine runoff and sedimentation from rangeland. Development and testing of SPUR is nearly complete, and the model should be released soon. NTC range conservationists will provide technical support.

- [Comments or model experience](#)

55. **SWAT** is an USDA - Agricultural Research Service computer model to predict the effect of management decisions on water, sediment, nutrients, and pesticides yields in large ungaged river basins. It utilizes SWRRBWQ technology enhanced with reach routing and capability to subdivide into more than 100 sub basins.

- [Comments or model experience](#)

56. **Simulator for Water Resources in Rural Basins - Water Quality (SWRRBWQ)** is an USDA - Agricultural Research Service computer model used to predict the effect of management decisions on water, sediment, nutrient and pesticide yields at the sub basin or basin outlet. Outputs related to nutrients, pesticides, and sediment are provided. The model tracks the fate of pesticides and phosphorus from land to deposition in water bodies.

- [View Factsheet about SWRRBWQ](#)
- [Model Information and Retrieval](#)
- [Comments or model experience](#)

57. **TR-20** is a Natural Resources Conservation Service computer model used for hydrologic evaluation of flood events for analysis of water resource projects. Flood hydrographs are developed and routed through stream channels and reservoirs.

- [Comments, Assistance, or model experience](#)

58. **TR-55 and Extended TR-55** present simplified manual and/or computer Natural Resources Conservation Service procedures to calculate storm runoff volume, peak discharge, hydrographs, and storage volumes required for flood water reservoirs. These procedures are applicable on small watersheds, especially urbanizing watersheds. Extended TR-55 expands the scale to larger drainage areas with rainfall/runoff relationships that range between "no" runoff to "total" runoff.

- [Comments, Assistance, or model experience](#)

59. **Tucannon Fishery Model** provides an assessment procedure to look at sediment effects on salmon stream habitat.

- [Comments, Assistance, or model experience](#)

60. **Universal Soil Loss Equation (USLE)** is a manual calculation procedure used to determine erosion rates at the end of a slope and provide an indication of the extent and location of sediment sources. USLE rates cannot be correlated directly with sediment delivery. Field location or proximity to streams or water bodies, land form, and runoff characteristics must be considered to determine a relative hazard of sedimentation from eroding areas. Erosion rates provide an indication of the relative amount of soil attached nutrients and pesticides that may leave a site with sediment.

- [Comments, Assistance, or model experience](#)

61. **Water Budgets** provides a procedure to assess the volume of water leaving a site as surface runoff, evapotranspiration, or deep percolation. Budgets can be developed for various management systems that indicate the time or season that excess water is most likely to be lost to runoff or leaching. This information can aid in planning the timing of nutrient and pesticide applications. Under irrigated conditions this information is necessary to plan "Irrigation Water Management" to conserve water and minimize the loss of water soluble nutrients, pesticides, and salts.

- [Comments or model experience](#)

62. **Water Quality Indicators Guide** is a Natural Resources Conservation Service manual process that can be used to conduct in-stream and receiving water body biological assessments. Assessments can provide information to determine if sediment, agri-chemicals, animal waste, or other considerations are negatively impacting a particular body of water or watercourse. If a problem exists, the guide can aid in identifying which areas within the watershed are contributing to the problem.

- [Comments, Assistance, or model experience](#)

63. **Water Erosion Prediction Project (WEPP)** is an USDA - Agricultural Research Service computer model using current water erosion prediction technology. WEPP has a field scale version for single field planning and a proposed watershed version for project planning. Outputs will provide information on runoff, the form of sediment loss from a field, and the sediment characteristics.

- [View Factsheet about WEPP](#)
- [Model Information and Retrieval](#)
- [Comments or model experience](#)

64. **Wind Erosion Equation (WEQ)** is a Natural Resources Conservation Service computer process that provides an estimate of airborne soil particles and attached nutrients and pesticides that are removed from a field by wind erosion. This information provides an indication of sediment, nutrients, pesticides, and pathogens that are available for transport and deposition in water bodies. Numerous site characteristics, such as distance to water bodies, must be considered when assessing the impact on water quality from materials moved and deposit.

- [Comments, Assistance, or model experience](#)

65. **Hydrologic Unit Model for the United States (HUMUS)** is a GIS/GRASS interface linked to the

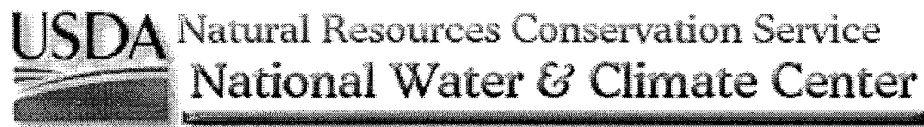
SWAT model.

- [View Factsheet about HUMUS](#)
- [Comments or model experience](#)

Published resource information about water quality conditions, characteristics, vulnerability, and problems can be obtained from reports, maps, and studies. Much of the basic information on the condition of ground and surface water resources may be obtained from the State Water Quality Management Agency, United States Geological Survey, US - Environmental Protection Agency, and State geologic survey agencies.

Many of these references that provide information on local conditions are part of the USDA - Natural Resources Conservation Service, Field Office Technical Guide (FOTG) Section I.

This page was Last revised on October 6, 1997.



Surface Water Tools: Field Scale

Resource: Water
Consideration: Quality

Problems/Concerns									
Tools	Pesticides	N / O / U / T / R / I / A / E / N / I / T / S / S	S / S / U / E / S / D / P / I / E / M / N / E / D / N / E / T / E / D	L / D / O / I / X / W / S / Y / S / G / O / E / L / N / V / E / D	S / A / L / I / N / I / T / Y	M / H / E / E / T / A / V / L / Y / S	T / E / M / P / E / R / A / T / U / R / E	P / A / T / H / O / G / E / N	A / H / S / Q / U / A / I / T / A / B / I / L / I / T / Y
AHEP									I
AWM		Q							
CREAMS	Q	Q	Q						
COFARM	I	I	I						
DRAINMOD	I	I			I	I			
EPIC	Q	Q	Q						
GLEAMS	Q	Q	Q						
MWASTE		R							R
NAPRA	R								
NPURG	R								
NLEAP		R							
NTRM		I	I						
PRZM	Q								
SPAW	I	I			I				
RZWQM								Q	

Legend: Q= Quantified* R= Relative Potential/Amount I=Indication of Condition/Cause

Field Application Tools are those designed to be applied at a small scale, such as a field, pasture, or point within these.

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Surface Water Tools: Watershed Scale

Resource: Water
Consideration: Quality

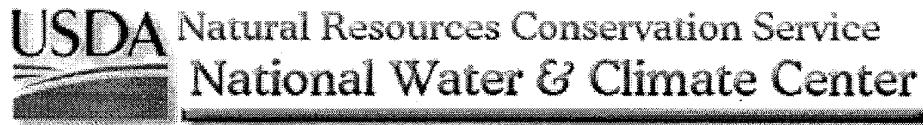
Tools	Problems/Concerns								
	P e s t i c i d e s	N / u O t r g i a e n i t c s s	S S u e d p i e m n r d n e t d	L D O o i x w s y s g o e l n v e d	S a l i n i t y	M H e e t a v e l y s	T e m p e r a t u r e	P a t h o g e n	A H S q a u b i t a t t a i a b c t l e
AGNPS	Q	Q	Q	Q				I	
ANSWERS		Q	Q						
BASIN	I	I	I	I		I	I	I	
Carlson's		I		I					I
Tropic									
State									
Index									
HSPF	Q	Q	Q	Q			Q		
Rapid									I
Bioass.									
Tech.									
SWRREWQ	Q	Q	Q						
Tucannon			Q	Q			Q	Q	
Fishery									
Model									
BETTER		Q	Q	Q			Q		I

Legend: Q= Quantified* R= Relative Potential/Amount I=Indication of Condition/Cause

Watershed evaluation allows for application to two or more fields or resources with common drainage.

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Surface Water Tools: Under Development

Resource: Water
Consideration: Quality

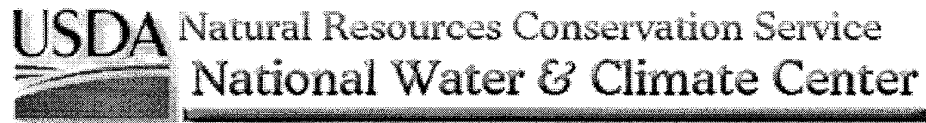
Tools	Problems/Concerns									
	P e s t i c i d e s	N / u O t r r g i a e n n i t c s s	S S u e s d p i e m n r d n e t d	L D O o i x w s y s g o e l n v e d	S a l i n i t y	M H e e t a v l y s	T e m p e r a t u r e	P a t h o g e n	A H S q a u u b i a i t t t a i a b c t l e	
NMP									I	
ROTO								Q		
Sediment									I	
Del.										
Ratio										
Curves										
WEPP		I	I							
SWAT	Q	Q	Q							
HUWQ	Q	Q	Q							
HUMUS	Q	Q	Q							
Ann AGNPS	Q	Q	Q	Q				I		

Legend: Q= Quantified* R= Relative Potential/Amount I=Indication of Condition/Cause

Under Development - Models that have come to attention that are under development or testing which deal with water quality issues.

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**Ground Water Tools: Field Scale****Resource: Water****Consideration: Quality**

Tools	Problems/Concerns				
	Pesticides	Nutrient/ Organics	Salinity	Heavy Metals	Pathogens
<u>CREAMS</u>	R	R			
<u>CHEMRANK</u>	R	R			
<u>COFARM</u>	I	I			
<u>DRAINMOD</u>	I	I	I	I	
<u>EPIC</u>	Q	Q			
<u>GLEAMS</u>	Q	Q			
<u>LEACHM</u>	Q	Q			
<u>MWASTE</u>		R			R
<u>NAPRA</u>	R				
<u>NPURG</u>	R				
<u>NLEAP</u>		R			
<u>NTRM</u>		I			
<u>PRZM</u>	Q				
<u>SPAW</u>	I	I			
<u>RZWQM</u>	Q	Q			

Legend: Q= Quantified* R= Relative Potential/Amount I=Indication of Condition/Cause

Field Scale Tools are those that are designed to be applied at a small scale, such as a field, pasture, or point within these.

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Ground Water Tools: Other Tools

Resource: Water
Consideration: Quality

Tools	Problems/Concerns					Application
	Pesticides	Nutrient/ Organics	Salinity	Heavy Metals	Pathogens	
SWRRBWQ	I	I				ws
SWAT	Q	Q				dev
HUWQ	Q	Q				dev
HUMUS	I	I				dev
Farmstead Screening	I	I			I	FOCS
Nutrient Screening		R				FOCS
Pesticide Screening	R					FOCS

Legend: Q= Quantified* R= Relative Potential/Amount I=Indication of Condition/Cause

Application= "ws" is a watershed evaluation tool that allows for application to two or more fields or resources with common drainage, "dev" is a model under development and evaluation. "FOCS" is a model tied to the Natural Resource Conservation Service (NRCS) Field Office Computing System (FOCS) and applicable databases.

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